

EXERCISES

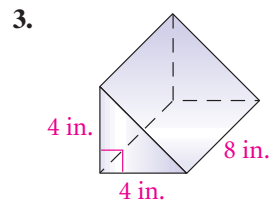
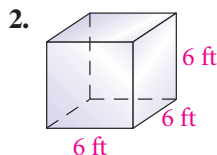
For more practice, see *Extra Practice*.

Practice and Problem Solving

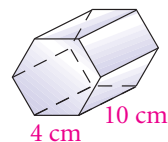
A Practice by Example

Example 1
(page 529)

Use a net to find the surface area of each prism.

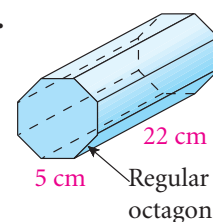
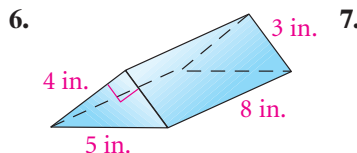
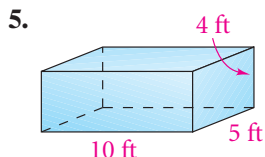


4. a. Classify the prism.
b. Find the lateral area of the prism.
c. The bases are regular hexagons. Find the sum of their areas.
d. Find the surface area of the prism.



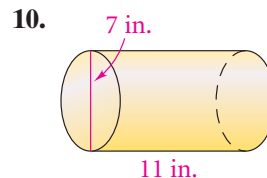
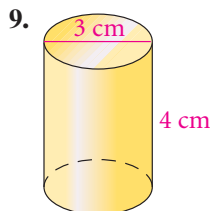
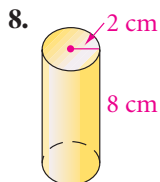
Example 2
(page 529)

Use formulas to find the lateral area and surface area of each prism. Show your answer to the nearest whole number.



Example 3
(page 531))

Find the surface area of each cylinder in terms of π .

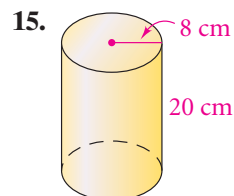
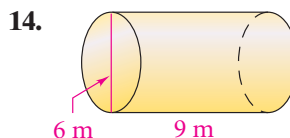
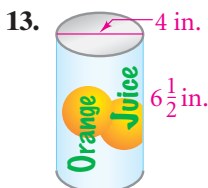


11. A standard drinking straw is 19.5 cm long and has a diameter of 0.6 cm. How many square centimeters of plastic are used in one straw? Round your answer to the nearest tenth.

Example 4
(page 531)

12. **Packaging** A cylindrical carton of oatmeal with radius 3.5 in. is 9 in. tall. If all surfaces except the top are made of cardboard, how much cardboard is used to make the oatmeal carton? Round your answer to the nearest square inch.

Find the surface area of each cylinder to the nearest whole number.



B Apply Your Skills

16. A triangular prism has base edges 4 cm, 5 cm, and 6 cm long. Its lateral area is 300 cm^2 . What is the height of the prism?

17. **Estimation** Estimate the surface area of a cube with edges 4.95 cm long.



18. **Writing** Explain how a cylinder and a prism are alike and how they are different.

19. A hexagonal pencil is a hexagonal prism. A base edge of the pencil has length 4 mm. The pencil (without eraser) has height 170 mm. How much surface area of a hexagonal pencil gets painted?



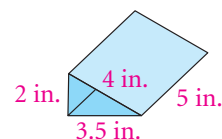
20. **Open-Ended** Draw a net for a rectangular prism with a surface area of 220 cm^2 .

21. Consider a box with dimensions 3, 4, and 5.
- Find its surface area.
 - Double each dimension and then find the new surface area.
 - Find the ratio of the new surface area to the original surface area.
 - Repeat parts (a)–(c) for a box with dimensions 6, 9, and 11.
 - Make a Conjecture** How does doubling the dimensions of a rectangular prism affect the surface area?

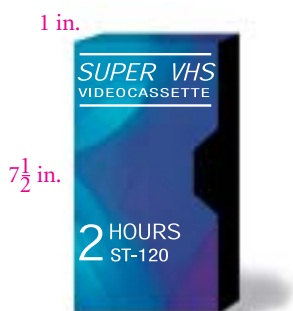
22. The surface area of a cube is 726 in.^2 . What is the length of each lateral edge of the cube?



23. **Pest Control** A flour moth trap has the shape of a triangular prism that is open on both ends. An environmentally safe chemical draws the moth inside the prism, which is lined with an adhesive. Find the surface area of the trap.



24. **Packaging** A typical box for a videocassette tape is open on one side as pictured at the left. How many square inches of cardboard are in a typical box for a videocassette tape?



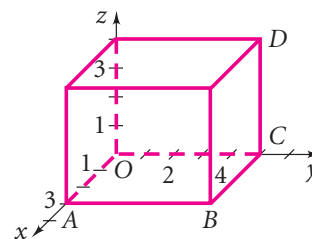
Exercise 24

25. Suppose that a cylinder has a radius of r units, and that the height of the cylinder is also r units. The lateral area of the cylinder is 98π square units.

- x²** a. **Algebra** Find the value of r .
b. Find the surface area of the cylinder.

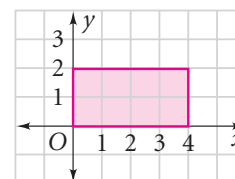
26. a. **Geometry in 3 Dimensions** Find the three coordinates of each vertex A , B , C , and D of the rectangular prism.

- Find AB .
- Find BC .
- Find CD .
- Find the surface area of the prism.



Visualization The plane region is revolved completely about the given line to sweep out a solid of revolution. Describe the solid and find its surface area in terms of π .

- the y -axis
- the x -axis
- the line $y = 2$
- the line $x = 4$



31. a. **Critical Thinking** Suppose you double the radius of a right cylinder. How does that affect the lateral area?



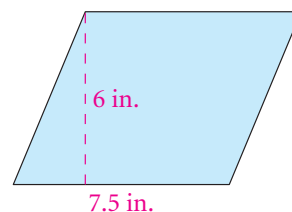
Need Help?

In Exercise 32, the slanted sides of the parallelogram form a spiral seam about the biscuit cylinder. The horizontal sides form circular bases.

- b. How does that affect the surface area?
c. Use the formula for surface area of a right cylinder to explain why the surface area in part (b) was not doubled.



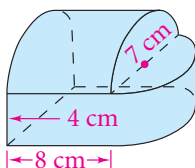
32. a. **Packaging** The wrapper for a container of biscuits is a parallelogram with base 7.5 in. and height 6 in. Find the radius and height of the container.
b. Find the surface area of the container of biscuits.



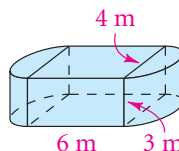
Challenge

Judging by appearances, what is the surface area of each solid?

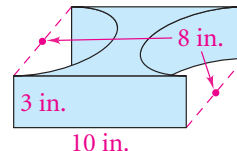
33.



34.

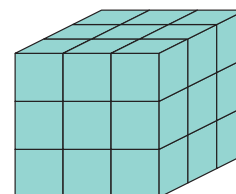


35.



36. **Algebra** The sum of the height and radius of a cylinder is 9 m. The surface area of the cylinder is $54\pi \text{ m}^2$. Find the height and the radius.

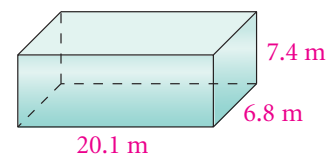
37. Each edge of the large cube at the right is 12 inches long. The cube is painted on the outside, and then cut into 27 smaller cubes. Answer these questions about the 27 cubes.
a. How many are painted on 4, 3, 2, 1, and 0 faces?
b. What is the total surface area that is unpainted?



Standardized Test Prep

Multiple Choice

38. What is the surface area of the figure to the nearest tenth?
A. 335.7 m^2 B. 411.6 m^2
C. 671.5 m^2 D. 721.2 m^2



39. If the radius and height of a cylinder are both doubled, then the surface area is ?.
F. the same G. doubled H. tripled I. quadrupled
40. A cylinder of radius r sits snugly inside a cube. Which expression represents the difference of their lateral areas?
A. $2r^2(8 - \pi)$ B. $2r(\pi - 2)$ C. $2r(4 - \pi)$ D. $4r^2(4 - \pi)$

Quantitative Comparison

Compare the boxed quantity in Column A with the boxed quantity in Column B. Choose the best answer.

- A. The quantity in Column A is greater.
B. The quantity in Column B is greater.
C. The two quantities are equal.
D. The relationship cannot be determined from the information given.

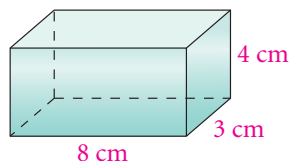


Figure 1

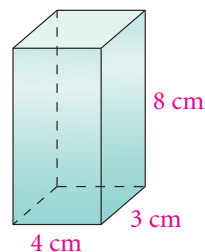


Figure 2

Column A

Column B

41. perimeter of the base
in Figure 1

perimeter of the base
in Figure 2

42. lateral area in Figure 1

lateral area in Figure 2

43. surface area in Figure 1

surface area in Figure 2



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Short Response

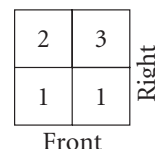
44. The sides of a base of a right triangular prism are 6 in., 8 in., and 10 in. The lateral area of the prism is 48 in.^2 .
- Find the height of the prism. Explain your reasoning.
 - What is the surface area of the prism?

Mixed Review

Lesson 10-2

Make each type of drawing from the foundation drawing at the right.

- an isometric drawing
- an orthographic drawing

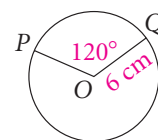


- Draw sketches to show how three planes can intersect a cube to form three different rectangular cross sections.

Lesson 7-7

Find the area of each part of the circle to the nearest tenth.

- sector QOP
- the segment of the circle bounded by \overline{QP} and \widehat{QP}



Lesson 6-7

50. In the kite at the right $AB = AD$ and $CB = CD$.

- Points P , Q , R , and S are midpoints.
- Determine the coordinates of the midpoints.
 - $RQ = \square$; $SP = \square$;
 $PQ = \square$; $SR = \square$
 - Use your answers to part (b) to explain why $PQRS$ must be a parallelogram.

